

## PATENT SPECIFICATION



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## COMPLETE SPECIFICATION

**Process for Producing Filaments from a Liquid Raw Material which  
may be Solidified by the Action of Liquid or Gaseous Media**

I, Dr. HEINRICH ZIEGNER, of 20, Lützowstrasse, Hagen, Westphalia, Germany, a Citizen of the German State, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

The present invention relates to a process for producing filaments from a liquid raw material that may be solidified by the action of liquid or gaseous media. In the known processes the raw material to be solidified is sprayed by means of fine nozzles into a falling liquid in which the filament solidifies. Under these conditions there is the difficulty of obtaining filaments that are always of one uniform thickness, for the mass as it leaves the nozzle is still quite liquid, but is subject to a certain tension. Furthermore the known processes have the disadvantage that it is difficult to produce a perfectly uniform filament.

By means of the process according to the invention these disadvantages are avoided and considerable further advantages are secured by feeding the raw material under pressure if required, through a tubular body, the walls of which are porous to a liquid or a gas, and the operative medium is introduced, under higher pressure if required, through the porous walls of the tubular body and thus is caused to act on the raw material in such manner that solidification takes place during the passage through the tubular body. It will be understood that this does not exclude the possibility of passing the completely formed filament, after it leaves the small tube, freely through a medium which may solidify the filament still further.

In explanation of the process according to the invention the course of the process is diagrammatically illustrated in the drawing.

Referring to the drawing, the solution *c* in the vessel *d*, which is to be solidified is passed under a moderate pressure through a small highly porous porcelain tube *a*, the middle part of which passes through the liquid *e* in the vessel *b*

which is under the somewhat heavier pressure of the column *b*. By reason of the porosity the falling liquid forces its way through the fine pores, and comes into contact with the liquid to be solidified in a uniform film *f* over the whole periphery, so that the contents of the small tube are solidified to form the filament *f*. The falling liquid issuing from the pores covers the inner surface of the small tube with a uniform film, which causes the filament to slide down automatically when the small tube stands vertically.

The quantity of liquid to be solidified is always the same in the small porous tube when the composition is the same (and this also applies to the thickness of the filament), the quantity of liquid being only dependent upon the cross-section of the tube, so that thus with the same composition and the same small tube the filament is always the same in thickness. Thus the thickness of the filament is dependent upon firstly the composition of the mixture and secondly upon the cross-sectional area of the small tube.

Thus it is possible by varying the mixture, that is to say for example by changing the percentage of the solid constituents or altering the viscosity, to increase or decrease the cross-section of the finished filament within certain limits. Furthermore it will be understood that a thicker filament could be produced for example through a small tube of larger cross-section. In the process according to the invention therefore the further advantage is obtained that raw materials of different viscosities for example even quite thin liquids, can be used.

Particularly good results are obtained with the process according to the invention if the raw material be a coagulable substance, particularly rubber latex dispersions, and if as the active medium organic acids be used. The process according to the invention may however also be employed for any other raw material that can harden under the required conditions. Thus for example the raw material may consist of poly-

[Price 1/-]



merisation products such as mixtures of phenol and aldehyde and the active medium may be any acids. Finally glue-like raw materials may be treated by the process according to the invention, in which case aldehydes and particularly formaldehyde are caused to react on the raw materials.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is:—

1. A process for producing filaments from a raw material which becomes solid under the action of liquid or gaseous media, characterised in that the raw material is passed through a tubular body, whose walls are porous to a liquid or a gas, if necessary under pressure and the active medium is passed through the porous walls of the tubular body, if necessary under a higher pressure and is so caused to react upon the raw material whereby the solidification or definite shaping of the raw material is effected on its passage through the tubular body.

2. A process according to claim 1,

characterised in that as raw material coagulable substances are used, organic acids being preferred as the reacting medium.

3. A process according to claim 1, characterised in that as raw material coagulable substances are used, coagulating gases or vapours being used as the reacting medium.

4. A process according to claim 1, characterised in that as raw material polymerisation products such for example as mixtures of phenol and aldehyde are used, while acids constitute the reacting medium.

5. A process according to claim 1, characterised in that as raw material glue-like substances are employed while aldehydes such as formaldehyde are preferred as the reacting medium.

6. An article of manufacture being a filament solidified under the conditions described in any one of the preceding claims.

Dated this 16th day of May, 1935.

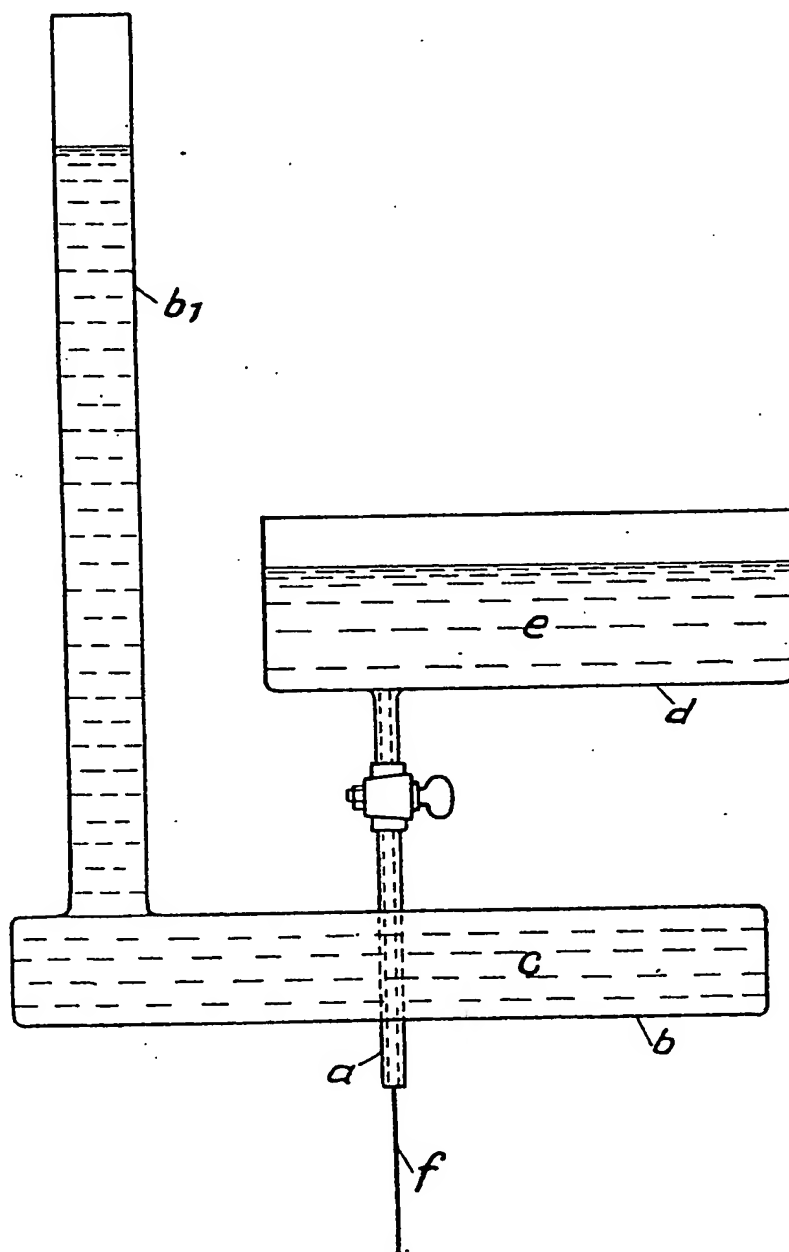
EDWARD EVANS & Co.,  
27, Chancery Lane, London, W.C.2,  
Agents for the Applicant.

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meaning of tubular?

Can it be flattened or  
double membrane  
spinner.

[This Drawing is a full-size reproduction of the Original.]



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